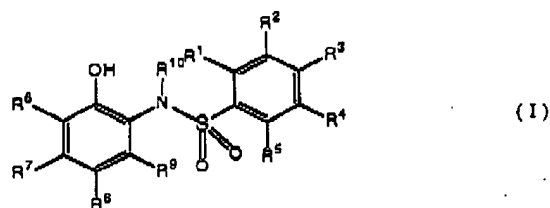


HIZATATE et al.
Serial No. 09/890,818

at least one member selected from the electron-accepting compound of the general formula (I),



in which each of R^1 to R^9 respectively represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, arbitrary two groups selected from R^1 to R^5 may bond to each other to form a ring, arbitrary two groups selected from R^6 to R^9 may bond to each other to form a ring, and R^{10} represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, and N,N'-bis(2-hydroxyphenyl)-4,4'-biphenyldisulfonamide; and

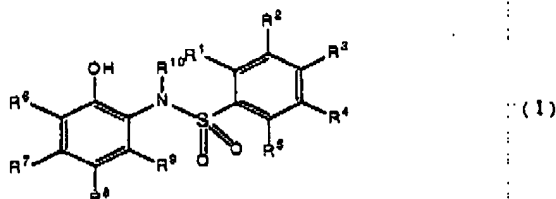
at least one electron-accepting compound selected from a diphenylmethane derivative, a benzoic acid derivative, a salicylic acid derivative and a urea derivative.

50. (New) The heat-sensitive recording material of claim 49, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

51. (New) A heat-sensitive recording material having an undercoat layer containing a pigment and an adhesive as main components and a heat-sensitive recording layer on a substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound

HIZATATE et al.
Serial No. 09/890,818

which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, or the heat-sensitive recording material optionally further having at least one protective layer on the heat-sensitive recording layer, wherein said heat-sensitive recording layer contains a benzenesulfonamide derivative of the general formula (I),



in which each of R^1 to R^9 respectively represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, arbitrary two groups selected from R^1 to R^5 may bond to each other to form a ring, arbitrary two groups selected from R^6 to R^9 may bond to each other to form a ring, and R^{10} represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms; and

at least one electron-accepting compound selected from a diphenylmethane derivative, a benzoic acid derivative, a salicylic acid derivative, a diphenylsulfone derivative and a urea derivative.

HIZATATE et al.
Serial No. 09/890,818

52. (New) The heat-sensitive recording material of claim 51, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

53. (New) The heat-sensitive recording material of claim 51, wherein the pigment contained in the undercoat layer is an oil-absorbing pigment which shows an oil absorption of 70 to 800 ml/100 g when measured according to JIS-K-5101 or organic hollow particles.

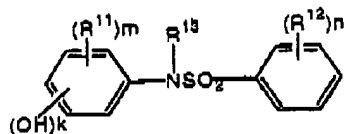
54. (New) The heat-sensitive recording material of claim 51, wherein the protective layer contains at least one selected from an acetoacetyl-modified polyvinyl alcohol, a carboxy-modified polyvinyl alcohol, a diacetone-modified polyvinyl alcohol or a silicon-modified polyvinyl alcohol, and a pigment, as main components.

55. (New) The heat-sensitive recording material of claim 51, wherein the heat-sensitive recording layer, the protective layer or both contain a benzotriazole-containing ultraviolet absorbent.

56. (New) A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said heat-sensitive recording layer contains two members selected from benzenesulfonamide derivatives of the general formula (II),

HIZATATE et al.

Serial No. 09/890,818



(II)

wherein each of R^{11} , R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2, and mixing weight ratio of two members of the benzenesulfonamide derivatives is from 1:9 to 9:1.

57. (New) The heat-sensitive recording material of claim 56, wherein the heat-sensitive recording layer contains a mixture prepared by mixing two members selected from benzenesulfonamide derivatives of the general formula (II) on a molecular level.

58. (New) The heat-sensitive recording material of claim 56, wherein the benzenesulfonamide derivatives are a combination of N-(4-hydroxyphenyl)-p-toluenesulfonamide and N-(2-hydroxyphenyl)-p-toluenesulfonamide.

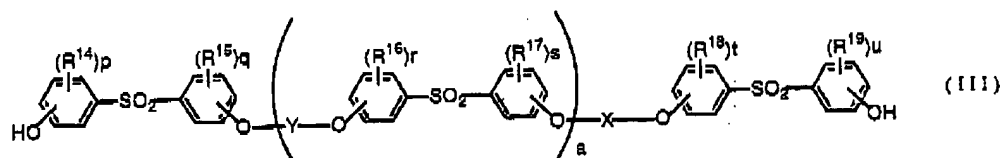
59. (New) The heat-sensitive recording material of claim 56, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

60. (New) A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said

HIZATATE et al.
Serial No. 09/890,818

heat-sensitive recording layer contains a benzenesulfonamide derivative and a diphenylsulfonamide derivative.

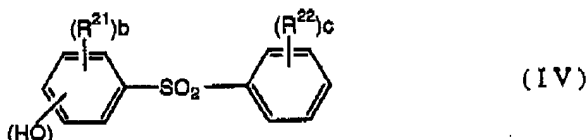
said diphenylsulfone derivative is a compound of the general formula (III),



wherein X and Y may be the same or different, each represents a linear or branched divalent hydrocarbon group which has 1 to 12 carbon atoms and may have a saturated or unsaturated ether bond, or a group represented by



in which R²⁰ is a methylene group or an ethylene group and T is a hydrogen or an alkyl group having 1 to 4 carbon atoms, each of R¹⁴ to R¹⁹ independently represents a halogen atom, an alkyl group or an alkenyl group, each of p, q, r, s, t and u is an integer of 0 to 4, respectively, provided that when they are 2 or more, those represented by any one of R¹⁴ to R¹⁹ may be the same or different, respectively, and a represents an integer of 1 to 10, or a compound of the general formula (IV),

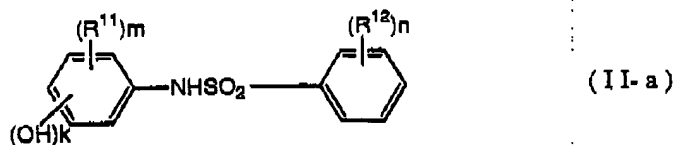


wherein each of R²¹ and R²² independently represents a halogen atom, a hydroxyl group, an alkyl group,

HIZATATE et al.
Serial No. 09/890,818

an alkenyl group, an aralkyl group, an aryl group, an alkoxyl group or a phenylsulfonyl group, b represents an integer of 0 to 4 and c represents an integer of 0 to 5,

said the benzenesulfonamide derivative is a compound of the general formula (II-a),



wherein each of R^{11} and R^{12} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2.

61. (New) The heat-sensitive recording material of claim 60, wherein the benzenesulfonamide derivative and the diphenylsulfone derivative are contained in a weight ratio of from 9:1 to 3:7.

62. (New) The heat-sensitive recording material of claim 60, wherein the heat-sensitive recording layer contains, as an additive, a hydroxybenzoic acid derivative of the general formula (V),

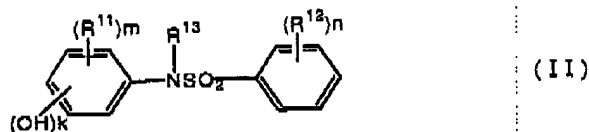


wherein Z is an oxygen atom or -NH group, R^{23} is an alkyl group, an alkenyl group, aralkyl group or an aryl group, and d represents an integer of 1 to 4.

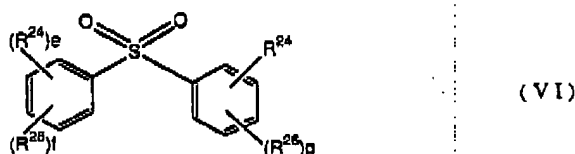
HIZATATE et al.
Serial No. 09/890,818

63. (New) The heat-sensitive recording material of claim 60, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

64. (New) The heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein the heat-sensitive recording layer contains at least one member selected from benzenesulfonamide derivatives of the general formula (II),

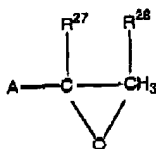


wherein each of R^{11} , R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2, and also contains at least one member selected from diphenylsulfone derivatives of the general formula (VI),



wherein R^{24} is a group

HIZATATE et al.
Serial No. 09/890,818



in which A represents $-(CH_2)_h-$, $-O(CH_2)_i-$ or

$-O(CH_2)_jO(CH_2)_v-$, each of R^{27} and R^{28} respectively represents a hydrogen atom

or an alkyl group having 1 to 6 carbon atoms, each of h and i represents an integer of 0 to

5, and each of j and v. represents an integer of 1 to 5, each of R^{25} and R^{26} respectively

represents a halogen atom, an alkyl group having 1 to 6 carbon atoms, an alkoxyl group

having 1 to 6 carbon atoms or a benzyloxy group which may have a substituent, e

represents an integer of 0 or 1, f represents an integer of 0 to 5 and g represents an integer

of 0 to 4.

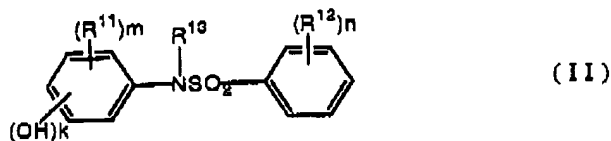
65. (New) The heat-sensitive recording material of claim 64, wherein the benzenesulfonamide derivative(s) is/are N-(4-hydroxyphenyl)-p-toluenesulfonamide and/or N-(2-hydroxyphenyl)-p-toluenesulfonamide.

66. (New) The heat-sensitive recording material of claim 64, wherein the diphenylsulfone derivative is 4-benzyloxy-4'-(2-methylglycidyoxy)diphenylsulfone.

67. A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said heat-sensitive

HIZATATE et al.
Serial No. 09/890,818

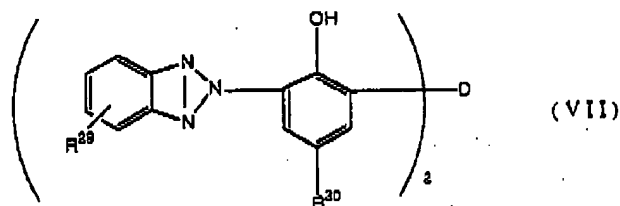
recording layer contains at least one member selected from the benzenesulfonamide derivatives of the general formula (II),



wherein each of R^{11} , R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2, and also contains an ultraviolet absorbent.

68. (New) The heat-sensitive recording material of claim 67, wherein the ultraviolet absorbent is a benzotriazole derivative.

69. (New) The heat-sensitive recording material of claim 67, wherein the ultraviolet absorbent is a dimer of a benzotriazole derivative of the general formula (VII),



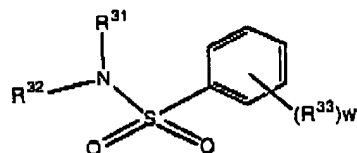
wherein R^{29} represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxyl group, an aryl group or an aryloxy group, R^{30} is an alkyl group having 1 to 18 carbon atoms, and D is an alkylidene group having 1 to 8 carbon atoms.

HIZATATE et al.

Serial No. 09/890,818

70. (New) The heat-sensitive recording material of claim 67, wherein the benzenesulfonamide derivative is N-(2-hydroxyphenyl)-p-toluenesulfonamide or N-(4-hydroxyphenyl)-p-toluenesulfonamide.

71. (New) The heat-sensitive recording material of claim 67, wherein the heat-sensitive recording layer contains a compound of the general formula (VIII),



(VIII)

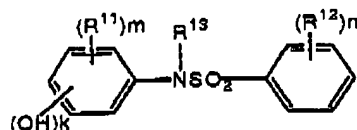
wherein each of R^{31} and R^{32} respectively represents a hydrogen atom, an alkyl group, an aralkyl group or an aryl group, respectively, R^{33} represents an alkyl group, an alkoxy group, an alkenyl group, an aralkyl group or an aryl group, and w represents an integer of 0 to 5.

72. (New) The heat-sensitive recording material of claim 67, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

73. (New) A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said heat-sensitive recording layer contains at least one member selected from the benzenesulfonamide derivatives of the general formula (II),

HIZATATE et al.

Serial No. 09/890,818



(II)

wherein each of R^{11} , R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms,

n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2, and contains an aromatic isocyanate compound.

74. (New) The heat-sensitive recording material of claim 73, wherein the heat-sensitive recording layer contains an imino compound.

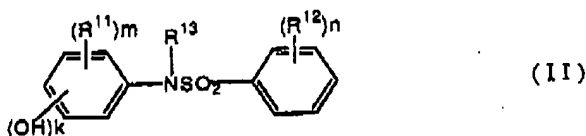
75. (New) The heat-sensitive recording material of claim 73, wherein the heat-sensitive recording layer contains at least two benzenesulfonamide derivatives of the general formula (II).

76. (New) The heat-sensitive recording material of claim 73, wherein N-(4-hydroxyphenyl)-p-toluenesulfonamide is contained or N-(4-hydroxyphenyl)-p-toluenesulfonamide and N-(2-hydroxyphenyl)-p-toluenesulfonamide are contained as benzenesulfonamide derivatives.

77. (New) A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and an electron-accepting compound which reacts with the electron-donating dye precursor

HIZATATE et al.
Serial No. 09/890,818

under heat to cause said electron-donating dye precursor to form a color, wherein said substrate contains a recycled paper pulp, and a benzenesulfonamide derivative of the general formula (II),



wherein each of R^{11} , R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2, is used as the electron-accepting compound.

78. (New) The heat-sensitive recording material of claim 77, wherein at least two benzenesulfonamide derivatives are used in combination.

79. (New) The heat-sensitive recording material of claim 78, wherein the benzenesulfonamide derivative(s) is/are N-(4-hydroxyphenyl)-p-toluenesulfonamide or a combination of N-(4-hydroxyphenyl)-p-toluenesulfonamide and N-(2-hydroxyphenyl)-p-toluenesulfonamide.

80. (New) The heat-sensitive recording material of claim 77, wherein the heat-sensitive recording layer contains a phosphoric ester derivative as an additive.

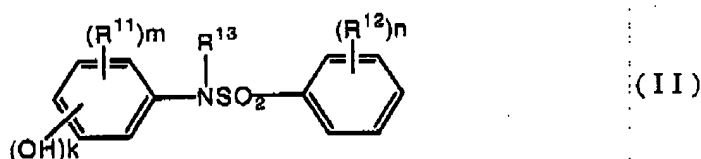
81. (New) A heat-sensitive recording material having a substrate and a heat-sensitive recording layer formed on the substrate, the heat-sensitive recording layer containing an electron-donating normally colorless or slightly colored dye precursor and

HIZATATE et al.
Serial No. 09/890,818

an electron-accepting compound which reacts with the electron-donating dye precursor under heat to cause said electron-donating dye precursor to form a color, wherein said substrate contains a non-wood pulp and at least one selected from a benzenesulfonamide derivative, a diphenylsulfonamide derivative, an benzoic acid derivative or a diphenylmethane derivative is used as the electron-accepting compound.

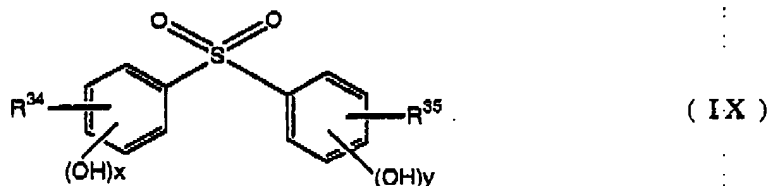
82. (New) The heat-sensitive recording material of claim 81, wherein the substrate has a non-wood pulp content of at least 10 % by weight.

83. (New) The heat-sensitive recording material of claim 81, wherein the benzenesulfonamide derivative is a compound of the general formula (II),



wherein each of R^{11} , R^{12} and R^{13} respectively represents an alkyl group having 1 to 4 carbon atoms, an alkoxyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an aralkyl group having 7 to 10 carbon atoms or an aryl group having 6 to 14 carbon atoms, n represents an integer of 0 to 5, m represents an integer of 0 to 4 and k represents 1 or 2.

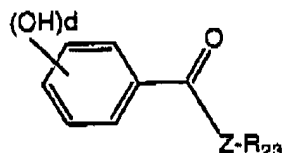
84. (New) The heat-sensitive recording material of claim 81, wherein the diphenylsulfone derivative is a compound of the general formula (IX),



HIZATATE et al.
Serial No. 09/890,818

wherein each of R^{34} and R^{35} respectively represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxyl group, an alkenyl group, an aralkyl group, an aryl group, an alkenyloxy group, an aralkyloxy group or an aryloxy group, x represents an integer of 1 to 3, and y represents an integer of 0 to 2.

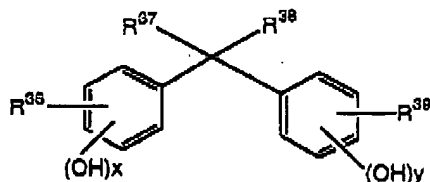
85. (New) The heat-sensitive recording material of claim 81, wherein the benzoic acid derivative is a compound of the general formula (V),



(V)

wherein Z is an oxygen atom or $-NH$ group, R^{23} is an alkyl group, an alkenyl group, aralkyl group or an aryl group, and d represents an integer of 1 to 4.

86. (New) The heat-sensitive recording material of claim 81, wherein the diphenylmethane derivative is a compound of the general formula (X),



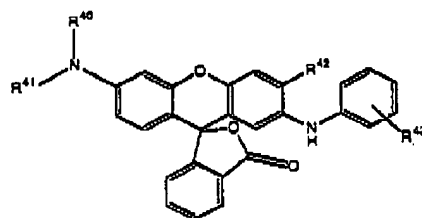
(X)

wherein each R^{36} to R^{39} respectively represents a hydrogen atom, a halogen atom, an alkyl group, an alkoxyl group, an alkenyl group, an aralkyl group, an aryl group, an alkenyloxy group, an aralkyloxy group, an aryloxy group or an alkoxy carbonylalkyl group, R^{37} and R^{38} may bond to each other to form a ring, x represents an integer of 1 to 3, and y represents an integer of 0 to 2.

HIZATATE et al.

Serial No. 09/890,818

87. (New) The heat-sensitive recording material of claim 81, wherein the dye precursor is a xanthene compound of the general formula (XI),



(XI)

wherein each of R^{40} and R^{41} respectively represents an alkyl group, an aryl group or an alkyl group and may bond to each other to form a ring, R^{42} represents a hydrogen atom, a halogen atom or an alkyl group, and R^{43} represents a hydrogen atom, a halogen atom, an alkyl group or a halogenated alkyl group.